

NEW DIRECTIONS IN COAL MARKETS

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Clyde established Energy Economics Pty Ltd, an independent commodity research house, in July 2000 with the aim of undertaking high quality strategic analysis of the international coal trade. He has since undertaken numerous consulting assignments focusing on coal supply & demand, and is the founder and editor of the monthly publication *Coal Trade*. Clyde is also developing a strategic multi-client study covering international coal supply, demand and prices out to 2012. Energy Economics provides services to major financial institutions, mining companies, coal consumers, government agencies, transport operators, and mining equipment/consumables suppliers.

Prior to joining Energy Economics, Clyde held the position of Associate Director at AME Mineral Economics, a Sydney based commodity research house, where he was responsible for that company's coal research. At AME, he produced annual four volume studies on the international coal trade, monthly 'Outlook' newsletters, maintained a mining database covering over 200 major export coal mines, managed a cost modelling enhancement programme, for a period managed the companies bulk commodity research team, and undertook various consultancy assignments on the international coal trade. Clyde was employed at AME from early 1996 until mid 2000.

Clyde's earlier employment included a position as Senior Mineral Economist with the NSW Coal Compensation Board and roles as Geologist, Senior Geologist, Technical Services Superintendent and Production Superintendent with Coal Corporation of New Zealand. He has over twenty years experience in the coal industry.

Clyde was raised and educated in New Zealand and completed a BSc degree in geology at the University of Waikato. He has resided in Sydney since 1994 with his wife, Penny, and two children.

New Directions In Coal Markets

Steam Coal Price Indexation and Internet Trading in the Post-Benchmark Era



March 2002

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ABSTRACT

Over the past five years we have seen some fundamental changes to the structure of the international coal industry. The electricity sector, the major end user of coal, has undergone a major shake up as part of a worldwide move to deregulate the industry. In the place of the old government owned electricity utility monopolies we now see privatised companies, or split up state owned corporations, operating in an increasingly competitive environment. While the electricity sector has become more fragmented, their international coal suppliers have aggressively consolidated, with four major international mining companies now controlling a large proportion of the worlds coal exports.

These changes in industry structure have already contributed to major changes in the marketplace, notably the demise in the Japanese benchmark pricing system, the growth in spot trade in Pacific Rim steam coal markets, and a greater willingness to adopt new technology to improve trading efficiency.

While the changes to the structure of the Pacific Rim steam coal market have already been profound, the true revolution may still be in front of us. Will transparent and open trading systems emerge from the shadows to snare a substantial share of a growing spot market? Internet trading of steam coal is in its infancy in the Atlantic Basin steam coal market, but it is yet to really even get off the ground in the Pacific Rim market. This paper concludes that internet trading systems will emerge to provide not only a new robust and transparent price index to replace the Japanese benchmark, but also greater market efficiency and the risk management tools that the industry requires.

THE DEMISE OF THE JAPANESE BENCHMARK SYSTEM

International steam coal markets have undergone a quiet revolution over the last few years, with changes to marketing arrangements being driven by the widespread deregulation of the major end user of coal; the electricity sector. Consolidation on the supply side has also accelerated changes within the industry.

Electricity Sector Deregulation

Over the past ten years we have seen a worldwide move to dismantle government owned electricity utility monopolies. In their place we now see privatised companies, or split up state owned corporations, operating in an increasingly competitive environment. We are in the midst of revolution in the fabric of the electricity industry in the major coal importing regions of the world. Western Europe now essentially consists of a single electricity market, with national borders forming little impediment to electricity marketing and sales. In Japan, we have seen deregulation result in the birth of independent power producers (IPPs), supplying electricity under contract to the major utilities, and competition across traditional distribution boundaries. In South Korea, the Korea Electric Power Company is being split into a number of smaller, competing, operating entities. In Chinese Taipei, IPPs are also becoming an established part of the electricity sector.

The days when electricity utilities had monopoly rights within their own distribution regions are rapidly coming to an end. The old utility monopolies could generally pass on increases in fuel costs to consumers with relative impunity, and their political masters often prioritised long-term security of fuel supply above fuel cost. Security of fuel supply of course remains very important to the new age electricity utilities, but cost competitiveness is now a much higher priority than was the case prior to deregulation.

Supply Side Consolidation

While the electricity utility sector is fragmenting into smaller units, international coal companies are moving in the opposite direction via international consolidation. In the mid 1990's we saw substantial rationalisation in the coal industries of the United States, Canada and South Africa. In Canada, only three significant coal exporters remain (Fording Coal, Luscar and Teck Cominco) following the takeover of Manalta by Luscar. There is the possibility of further consolidation in Canada now that Fording has been split off from CP Rail as a separately listed entity, with Fording now looking to be an attractive takeover target for another player in the international coal market. Similarly, in South Africa we now only have three large coal exporters (Anglo Coal, Ingwe and Duiker) with each controlled by major international mining companies, respectively Anglo American, BHP Billiton and Glencore/Xstrata. There are now, however, some moves towards greater diversification of coal exporters in South Africa through black empowerment initiatives.

The world's largest coal exporter Australia, was slow to initiate rationalisation, but has made up for its slow start with a breathtaking rate of consolidation over the last three years. Of particular note we have seen the exit of mid-sized players Shell, Peabody Australia, and Exxon. There will always be a role in the coal industry for small companies, extracting coal reserves that are too small to support world scale mining operations. But it has become clear that mid-sized coal mining companies are a dying breed. The mid-sized companies have neither the efficiencies of the small producers nor the access to capital and market weight of the majors. MIM, the only mid sized Australian coal producer not swallowed up in the recent rationalisation, instead embarked on an expansion programme that has already seen the development of the Oaky North mine and has recently seen it purchase Coal & Allied's share of Moura and moves to advance the Rolleston steam coal project.

The rationalisation of the coal export sector is expected to reduce the volatility of international coal markets, reducing the amplitude of the excessive swings in the supply demand balance that have been an historical feature of the industry. The large international coal companies that now dominate the industry, BHP Billiton, Rio Tinto, Anglo American and Glencore/Xstrata, have the resources and expertise to better evaluate rational development sequences for new mines. Furthermore, they are far better placed to cut production when required, with the idling of a high cost mines during a period of low demand having the potential to even increase profits by boosting the coal prices realised from its other mines. Smaller producers, by comparison, usually must produce at high levels, even during market downswings, or perish.

While industry rationalisation has reduced the propensity for boom-bust cycles, we believe that its impact on average steam coal price levels has been overplayed. Steam coal remains an abundant resource, with known reserves for over 200 years of production, and other players will rush to fill any vacuum created by sustained attempts by the major companies to constrain output to support artificially high prices. While much has been made of the high proportion of exports from Australia, South Africa and Colombia that is now controlled by the four major companies, China waits in the wings to pounce on any period of high market prices. Furthermore, the influence of the major international miners in Indonesia is waning, with divestments to local companies proceeding as a requirement of Indonesian Government Coal Contract of Works. Already we have seen sell-downs at Adaro (New Hope) and Arutmin (BHP Billiton) and similar processes are under way at the other two major exporting mines, Kaltim Prima (Rio Tinto/ BP Amoco) and Kideco (Samtan).

Perhaps more importantly for the topic of this paper, coal exporting companies are now, in the main, modern, well resourced international companies ready to adopt new technologies. Furthermore, they are multi-commodity mining companies, well versed in trading on open platforms such as the London Metals Exchange. The major players on international coal markets are now quite different beasts than they were a few years ago.

Market Transitions

The massive restructuring of the utility and coal export sectors outlined above has led to some significant changes in the way consumers and suppliers of internationally traded steam coal do business.

Of most importance, of course, has been the demise of the Japanese benchmark system that once underpinned pricing arrangement in the Pacific Rim and beyond. The Japanese utilities recognised that joint price negotiations were increasingly inappropriate now that they have become direct competitors with each other, and with new entrants. The steam coal benchmark system changed in Japanese fiscal 1998, when the price became a maximum or ceiling price for which the Japanese utilities paid for contract tonnage. The system has since continued to evolve, and, while a Japanese ‘reference price’ is still set each year, it now has little or no tonnage attached to it, and so it is essentially a meaningless number.

Under the benchmark system, lead negotiators representing Japan and Australia set prices that applied to all Australian exporters, and set the tone for pricing arrangements elsewhere. The move to individual price negotiations between each of the major Japanese utilities and each of their coal suppliers has therefore resulted in negotiations become increasingly complex and time consuming. This is mirrored in other economies, where utility break-ups have led to many utilities being directly involved in the negotiations where once there were relatively few. Annual face-to-face price negotiations have become cumbersome, inefficient and costly, particularly for the smaller players.

As a result we have seen utilities gradually introducing tendering as a partial replacement for face-to-face negotiations. With price setting by tender being more applicable to short term and spot contracts, the dominance of long-term contracts in the Asia-Pacific market is being progressively eroded, although long-term contracts still cover most of Pacific Rim coal volumes.

As utilities in Japan and Korea followed Taipower’s lead in initiating purchases of coal by tender, they found that, more often than not, coal purchased by tender was cheaper than prevailing long-term contract prices set by annual negotiation. As depicted in the graph overleaf, spot steam coal tender prices have been, on average, an astonishing US\$5.45 per tonne lower than annually negotiated contract prices over the past six years – even after taking into account estimated discounts under the tiered pricing structure that took effect in Japanese fiscal 1998/99. While the last six years mainly covers a time of market weakness, when coal producers have been prepared to offload surplus coal at a discount, the incentive for the deregulated utilities to increase the proportion of coal that they purchase on the spot market is unmistakable. Increased spot purchases were going to occur even if deregulation of the electricity sector had not been initiated. Deregulation has, however, served to accelerate the change.

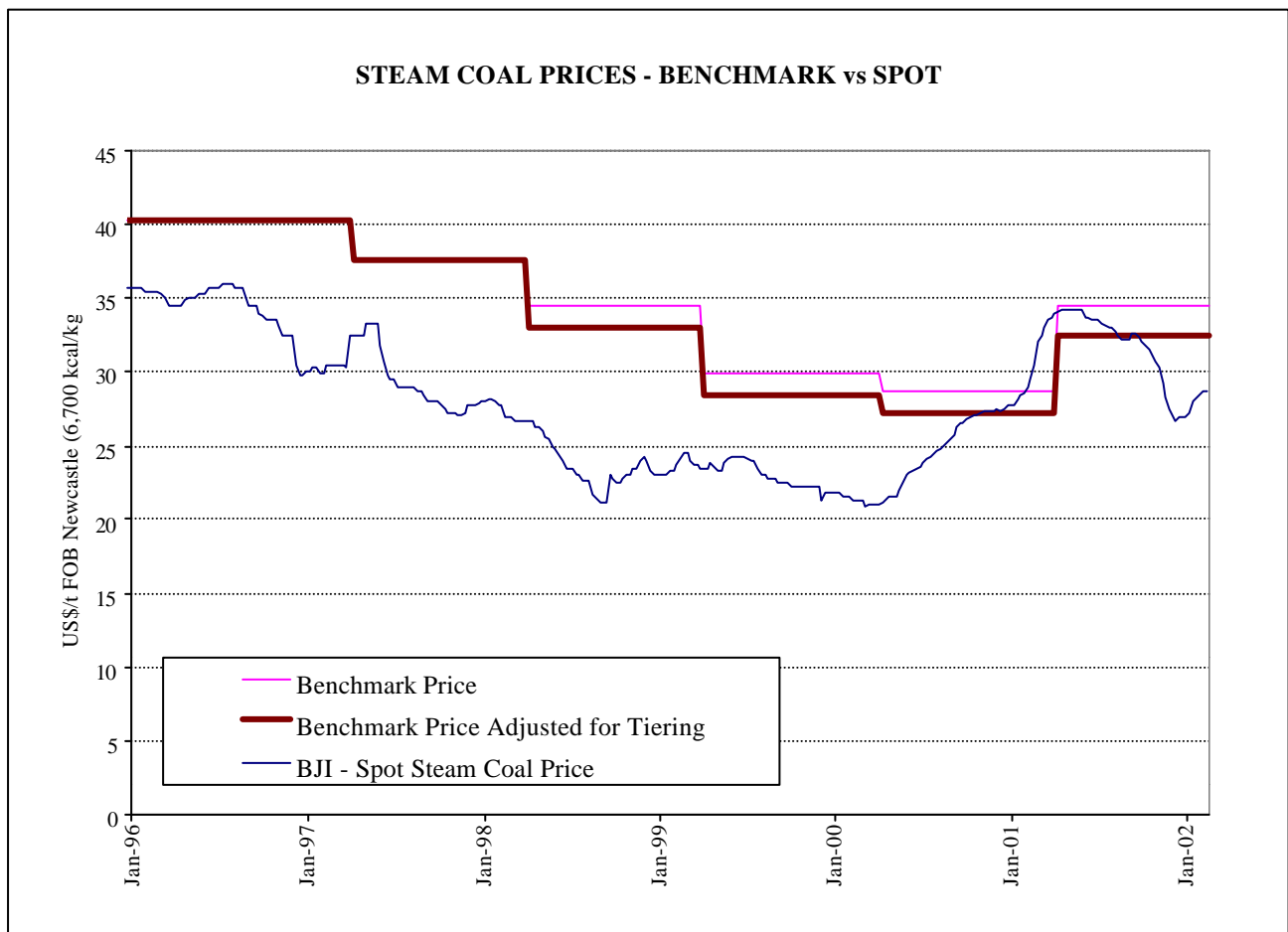
The discrepancy between average spot prices and contract prices indicates that annual price negotiations have not been efficient in representing market fundamentals. Despite the hand wringing that takes place in the Australian media each year that coal exporting companies settled at too low a price, it appears that the

utilities in fact have the greater incentive to move to a new system than the producers. The system of annual negotiations has also seen larger coal consumers pay more for their coal than smaller consumers!

One other change that has been accelerated by the deregulation of the electricity sector is an increased preparedness to use non-traditional coal types in order to help drive down fuel costs. Consumption of Indonesian sub-bituminous coals is the stand out example of this, and it is expected that large high volatile, high moisture, coal mines will also be developed in Queensland over the next few years, such as Acland (New Hope), Rolleston (MIM) and possibly Monto (Australian Premium Coals)

While the changes to the structure of the Pacific Rim steam coal market have already been profound, the true revolution may still be in front of us. Three main questions remain to be answered as to what the future holds.

1. Long-term contracts still predominate in Asian coal markets, whereas spot and short term contracts now account all but a tiny proportion of European steam coal imports. The move towards spot purchases in the Asian market has been quite slow, having been interrupted by the East Asian financial crisis and, more recently, by recession and an episode of high spot prices. During the East Asian financial crisis, when coal consumption slowed, utilities were over-committed under long-term contracts and had little scope to increase spot purchases. Subsequent to these hiccups in the trend, will the transition towards increase spot and short-term purchases in the Pacific Rim regain momentum and will Asia move rapidly towards a European style market?
2. While the benchmark system has now essentially disappeared, no new price index with wide



industry acceptance has emerged as a replacement. An index price that is robust and representative is required for price variation mechanisms in long-term contracts. Which of the alternative price series is likely to emerge as the industry standard?

3. Will transparent and open trading systems emerge from the shadows to snare a substantial share of a growing spot market? Internet trading of steam coal is in its infancy in the Atlantic Basin steam coal market, and it is yet to really even get off the ground in the Pacific Rim market. Furthermore, the move to contracts with shorter terms has led, in some cases, to greater long term pricing risk for both producers and consumers. The increase in pricing risk is of considerable importance. Long-term contracts have historically allowed the electric utility industry to finance the construction of coal-fired power generation units and coal producers to develop large green-field mining complexes without undue risk. Will internet trading systems provide not only a new robust and transparent price index to replace the Japanese benchmark, but also the risk management tools that the industry needs?

INDEXATION OF LONG-TERM CONTRACTS

Whereas spot transactions and short term contracts, with durations of a year or less, usually have a fixed price, long term contracts generally incorporate either ongoing renegotiation of prices at set intervals, usually yearly, or a mechanism for progressively adjusting the price of coal delivered under the contract according to some external index. (A long-term contract with annual price negotiations is, of course, somewhat of a contradiction in terms. What happens, after all, if the parties fail to agree on a price at the annual negotiations?).

Price indexing mechanisms for long-term contracts provide some protection to the parties from unpredictable future changes to conditions, such as inflation or exchange rate fluctuations, changes in input costs, and breakthroughs in technology or productivity. In the past, coal prices in long-term contracts were sometimes indexed to producer input costs, but this often led to serious overpricing as a result of failing to account for ongoing productivity and technology improvements. These days, contract prices are indexed against fluctuations in a publicly available reference coal price that is considered to be broadly representative of market conditions at any particular time.

For those without experience of these IPP contracts the pricing index formula is simply:

$$\text{Coal price in year 2005} = (\text{Base price at contract signing}) \times \frac{(\text{Index price in 2005})}{(\text{Index price at contract signing})}$$

In the past, many major East Asian steam coal consumers indexed their long-term contract prices against the Japanese benchmark price, but these consumers are turning to relying on their own annual negotiations now that a true Japanese benchmark price no longer exists. The demise of the Japanese benchmark price is not so much of a problem for these large utilities, but it is a major headache for the new breed of smaller private utilities and IPPs that need to access project financing to build new power plants.

Project financiers have historically insisted on IPP developers having long-term contracts covering the total volume of coal required by the project. The IPPs, like other coal consumers, would prefer to purchase their coal under a mix of long-term, medium-term and spot contracts that suits their requirements and that has the greatest potential to minimise project fuel costs. After all, spot prices have historically spent much

more time below long-term contract prices than above them. IPPs can strive to limit the duration of a proportion of their long-term contracts to the minimum duration the financiers can accept. In part this requires education of financiers regarding the situation that steam coal is not a scarce resource and supply shortages are generally of a limited nature. Again, a breakthrough in this regard may come when internet trading has gained sufficient liquidity to develop financial instruments such as swaps, collars and caps to hedge against future coal price increases to the satisfaction of financiers.

To our knowledge, all of the contracts that coal producers have signed to supply coal to IPPs still incorporate the Japan - Australia 'reference price' as the index for calculating future price movements. Furthermore, none of these contracts make provision for the fact that the 'reference price' is now some US\$2/t FOB higher than the actual average price of annually priced long-term contracts, even disregarding the lower prices attached to options for additional tonnage in excess of the contract base tonnage. Nor do these IPP contracts cater for the possibility that the 'reference price' may not even exist in a couple of years time, let alone at the end of a twenty year supply contract. This situation is clearly less than ideal and a new indexing mechanism needs to be introduced to replace the benchmark price.

Alternative Reference Indices

Numerous alternative price series have been considered by industry players as indices to replace the Japanese benchmark price as an index. These include:

- Average New South Wales export steam coal prices,
- Proprietary indices based on market intelligence such as the Barlow Jonker Index, and
- Spot steam coal prices from internet trading markets

Each of these alternatives would provide adequate, but by no means perfect, price series for use in the indexation of long-term contract prices. The Japan-Australia benchmark price had one significant advantage in that it was settled in advance, whereas the three alternatives listed above all rely on historical data and would therefore require backward adjustment of prices delivered into indexed contracts.

The use of the average New South Wales export steam coal price for indexing would have the advantage of the robustness that results from the significant slice of the total trade volume that it covers, but there are a number of disadvantages. Firstly there is the problem of the variability of the coal quality of exports, both in terms of the impact on the average price of episodic low quality shipments and, more importantly, the potential for a gradual drift in average coal quality parameters as old mines are shut down and new mines are brought into production. Steam coal exported from New South Wales is, however, relatively homogeneous, this being one of the reasons that it is preferred for indexing over other exporting areas. A second disadvantage is the chicken and the egg syndrome; if substantial volumes of steam coal being exported from New South Wales end up being indexed against average New South Wales average prices, then the index itself could become buffered from variations in the 'real' market. Thirdly, there is a problem with regard to the accuracy of the reported average prices. Australian exporters can report prices in either Australian dollars or United States dollars. Differing calculations of exchange rates can lead to errors in the statistics. It is noted that significant differences occur between the average prices reported by the Australian Bureau of Statistics and those reported by the Joint Coal Board.

With regard to the use of a proprietary index, for example the Barlow Jonker Index (BJI), a couple of problems also arise. The BJI index represents a relatively small segment of the market, despite being

expanded recently to incorporate utility trades and non-Japanese markets (it was previously restricted to trade between Newcastle shippers and Japanese general industry). More importantly, the BJI index and other indices of this type are compiled from surveys of producers, consumers, and/or traders, and so could be seen by coal consumers as open to manipulation and lacking in transparency.

The third alternative, spot price series from internet markets, has numerous advantages for use in indexing long-term contract prices, including transparency and well delineated coal quality parameters. The main disadvantage is the current lack of sufficient traded volume to ensure that prices truly reflect fundamental market conditions. If, however, the volume of internet trading continues to improve, indices based on this trade will likely become the accepted mechanism for indexing long-term prices for IPP and other long-term contracts.

E-TRADING

A liquid market for coal has been achieved on the US domestic market, but similar markets for internationally traded coal are still in their infancy. The real question is will internet trading of seaborne steam coal reach sufficient market acceptance, trade sufficient volumes, and be robust enough to fulfil its potential to fill the gap in both price indexing and risk management?

Electronic Trading Systems

Before we go on to discussing the future of electronic internet trading in the seaborne coal trade, it is perhaps worthwhile reviewing the different forms of this trading. There are three common trading systems used on the Internet.

Commodity Trading

Commodity trading involves a “many to many” system where, potentially, many sellers are communicating with many buyers. These systems are transparent, with prices and volumes openly displayed to registered market participants, but not the names of the bidding or offering companies. This system requires standard quality specifications for each product traded and a standard contract to implement the sale. With regard to the coal trade, one, or sometimes two, separate products are defined for selected major exporting and importing ports, each product having its own individual quality specifications. Transactions may result in physical delivery, but the standard quality specifications also allow easy re-sale of positions. The ratio of physical delivery to total transactions varies according to a number of factors, but in general physical trading dominates the start-up period, providing a base for later development of financial instruments.

The standard contracts provide great flexibility to utilities. For example, with offer prices quoted out a number of years in advance, coal consumers can buy a portion of their future coal requirements by internet commodity trading at affixed price. Then, if their coal requirements end up being less than expected (say, if there is high rainfall over their hydroelectric catchment areas) they can easily re-offer the coal on the commodity trading system. They could, of course, have re-sold the coal anyway, using traditional mechanisms, but the standard coal specifications, liquidity and anonymity of the internet commodity trading system certainly would make it a lot easier.

A market participant will not necessarily be happy to do business with all of the other registered participants; so how does it avoid such transactions? Each participant in the market usually lists the other

registered parties it is happy to deal with; this is called a counter-party list. Each bid or offer is marked in some way on the screen (by the colour of the bid price in the case of Global Coal) to indicate if it has counter-party approval.

Coal brands that don't fall within the specified quality range for one of the defined products obviously cannot be traded using this system. This situation also, of course applies, to coals routed through ports for which internet products are not available. Such coal brands can trade using one of the following systems.

Auctions

Auctions involve 'many to one' communications where there is one seller auctioning its coal to many buyers. There are also 'reverse' auctions where one buyer auctions the purchase of coal from a number of sellers.

These systems are generally one off and require considerable effort to set up so that the parties are informed of the time period, conditions and specifications of the auction to secure their participation. In a reverse auction, pre-qualification of coals that might be suitable for the buyer's plant may be required. As with commodity trading, prices are generally displayed during the course of the bidding, but not the players.

Notice Boards

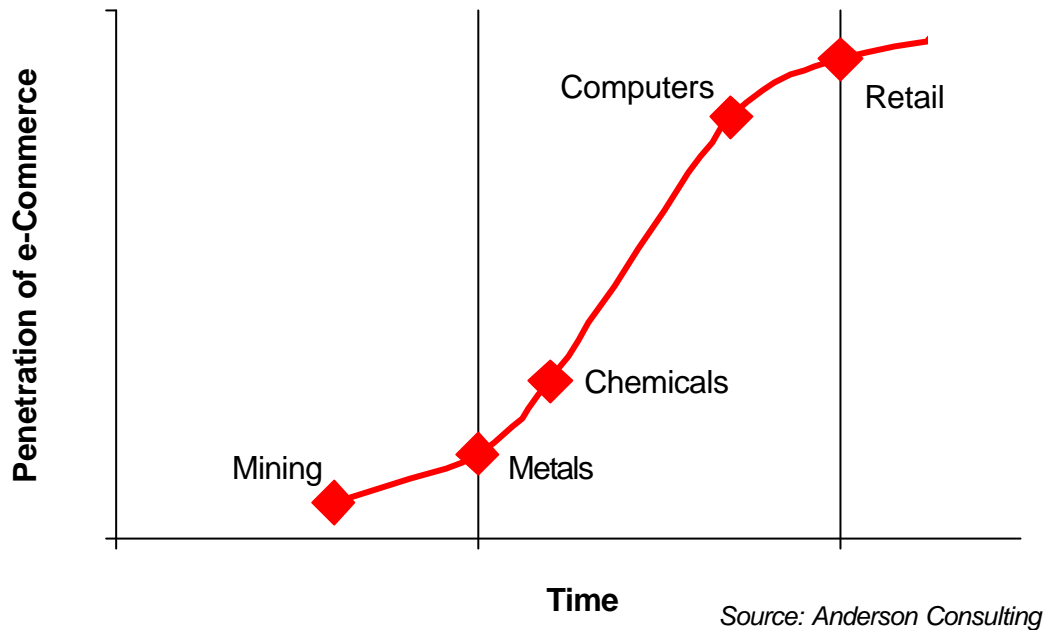
Notice boards are 'one to one' communication systems. It is a bit like an introduction agency, as there is one buyer who responds to one seller that advertises on the notice board.

Negotiations can take place between the two parties regarding technical issues and there are no time limits imposed except those imposed by the players themselves, who may only wish to advertise a product for a limited time period. The transactions can be totally confidential or they can provide disclosure by choice of the players.

Development of Electronic Trading for Seaborne Coal

The mining industry in general, and the seaborne coal sector in particular, has been slow to embrace e-commerce compared to the uptake of the technology in other industries. In part this is because coal has certain attributes that make it somewhat difficult to sell as a standardised commodity, but firmly entrenched methods of relationship marketing are an equally significant factor.

e-Commerce Maturity Stages



The Variability Problem

A plethora of coal brands are traded on international coal markets, reflecting to a degree the inherent quality variations of coal, which is of course a natural product that undergoes relatively little processing prior to sale.

This variability is particularly significant with regard to coking coal. As most readers will be aware several brands of coal are blended together prior to being fed into a coke oven battery. There is a complex interaction between the coals in a blend, with the blend being designed to achieve the desired result of low coke oven pressures, melding of the coals to produce a uniform coke, high coke strength, and high coke porosity. Furthermore, the properties of a coke that is produced from a given blend of coals is not fully definable in advance by theoretical calculations, so the introduction of a new coal into a blend requires trial coking and is therefore not undertaken lightly. Coke-makers therefore tend to purchase their coal under long-term contracts to ensure availability of the many component coal types that they require. A further factor is the limited number of suppliers, particularly of hard coking coal. For a particular component coal for a coke oven blend there may only be a couple of potential supply companies, which is a situation better suited to prices being set by negotiation than by a competitive bidding process. Of course the 'uniqueness' of coking coal brands can be over-emphasised. Coking coal is, after all, already being increasingly purchased by ordinary tender processes, and could, in theory be subdivided into several categories to be traded on an open electronic market. But there is little incentive to do so and, to my knowledge, no company has plans to attempt it.

Steam coal also exhibits a wide range of chemical and physical properties, but its commoditisation is a simpler process owing to the following factors:

- The value of steam coal is more firmly based on a single parameter – its energy content.
- A large proportion of the major brands of steam coal fall within a reasonably narrow quality specification range.

It is therefore possible to define a standard range of coal quality parameters which is narrow enough that variations within the range do not impact substantially on the value of the coal, yet which is wide enough to encompass most major steam coal brands. Mainstream e-commerce efforts to date have concentrated on defining such standard quality ranges and then trading brands that fall within them. As noted previously, separate systems have also been set up to trade unusual coal brands; those with high sulphur content, high ash, low ash fusion temperature.

The Cultural Problem

There is a natural inertia to change and acceptance of any new way of doing things always takes time. The potential players need time to become informed and educated with regard to the new systems. Then informed decisions can be made on the basis of the comparative merits and disadvantages of the new and old systems. Coal marketers and purchasers have generally invested much of their working life developing the skills and contacts required for relationship marketing and are naturally worried to see the value of this expertise down-valued by a new and impersonal system.

Furthermore, some companies have been more successful than others in achieving good price outcomes under the old marketing systems. Such companies are naturally reticent to move away from a system under which they have a competitive advantage in the form of superior systems and staff expertise.

The Advantages

The problems of coal quality variability and entrenched interests are, we believe, are outweighed by numerous potential benefits to the coal industry. The advantages are well summarised by Global Coal:

- a liquid marketplace with significant depth of volume for efficient coal trading;
- accurate pricing benchmarks and indices based on actual transactions;
- the creation of a forward pricing curve providing improved insight into future pricing levels;
- the development of tools and instruments for hedging and coal price risk management;
- increased levels of transparency, price discovery and competitiveness;
- enhancement of coal's image as a modern and competitive fuel as it becomes more tightly integrated with other energy markets such as electricity, gas and oil; and
- transaction and cost savings for all industry participants.

Both consumers and producers of internationally traded coal should benefit from a more structured and transparent new market. The larger players sometimes overlook the advantages that would accrue to smaller consumers and miners. These smaller companies cannot afford large marketing/purchasing departments required to fully keep up to speed with the often bewildering number of combinations of coal suppliers, qualities, and transportation options that exist in the coal market. The smaller companies have higher unit costs in these areas, as they are dealing with smaller volumes over which to spread marketing costs.

It is proving possible and beneficial to simplify the market by defining generic specifications and standard contract terms. The application of these specifications and terms should lead to increased market activity, the development of a liquid physical and financial futures market, and the opportunity to employ the full range of sophisticated and effective risk management techniques in such markets.

The liquidity of the electronically traded markets offers coal consumers substantially improved flexibility to respond to changes in demand by rapidly buying or selling coal. This flexibility is due to the clarity and liquidity brought to pricing by creating a uniform frame of reference

Access to price stabilising financial instruments is also important to those industry players that have substantial requirements for debt financing, or those companies whose shareholders value stability of earnings.

THE FUTURE

There appears little doubt that electricity utilities in the major Asian steam coal importing economies will procure increasing proportions of their coal requirements via spot and short-term tenders, at the expense of traditional long-term contracts with annual price negotiations. While it is difficult to envisage the Asia-Pacific market duplicating the *modus operandi* of the European market, where long-term contracts for imported coal are practically a thing of the past, it is likely that spot and short-term tenders could represent more than half of the Asia Pacific steam coal market by early next decade.

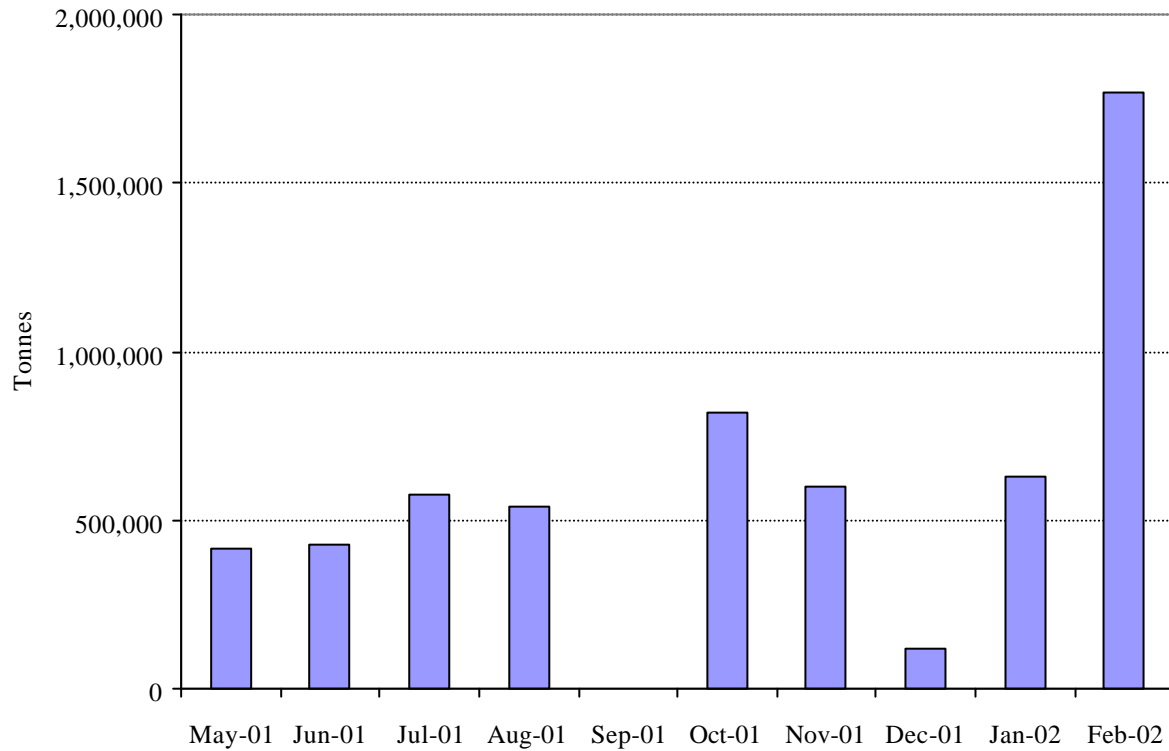
Internet trading of steam coal is already becoming established in the Atlantic markets, with Global Coal's spot transactions out of Richards Bay, South Africa, having grown to the point where a reliable weekly price index has recently been established. We expect internet trading of steam coal to also become firmly established in Pacific Rim markets, with Global Coal's Newcastle contract most likely to reach a critical mass of liquidity sometime within the next two to three years. This critical mass will occur when there is routinely sufficient liquidity that a reliable and transparent price is available. At that stage there will no longer be any point in market players periodically avoiding the market to retain a veil of secrecy over market conditions. Once this critical mass is reached, the future of commoditised internet trading of coal in the Pacific Rim will be assured, and growth in traded volumes will accelerate.

There are those that will disagree with this assessment, citing the cultural differences between Pacific Rim and Atlantic Basin markets and a general lack of enthusiasm for internet trading amongst coal purchasers and marketers in Pacific Rim markets. But the advantages of the commoditisation of coal, most probably via internet-based platforms, are difficult to ignore, most notably lower costs and more efficient markets. We believe that two forces will overwhelm the ambivalence of current marketing and procurement managers towards internet spot markets. Firstly a new generation of marketers and buyers, perhaps more comfortable with screen trading than face to face negotiations, will gradually take up senior roles in coal sales and procurement, and they will not have the same career investments in relationship marketing to protect. More importantly, the steam coal trade is increasingly dominated by a new breed of competitive utilities on the one side and large multi-national mining companies on the other. It seems likely that such companies, forever striving for increased efficiency and higher profits in all areas, will soon move to take full advantage of efficiencies of commoditised internet trading.

It was only as recently as April 1996 that the first Japanese utility, Tohoku Electric Power, purchased coal on the spot market. Tohoku was also the first Japanese utility to tender for spot coal on the internet, via a reverse auction in November 2000. That tender was limited to pre-qualified bidders, but Tohoku moved to its first open tender last year. Global Coal only commenced trading operations on 16 May 2001 and has since traded 6 Mt of coal – an annualised rate of some 7.5 Mtpy. So we are still very much in the formative years of internet trading of coal as a commodity. Following the demise of Enron, internet trading of

seaborne steam coal currently only represents a percent or two of the total trade. The next two years will tell with certainty if such platforms will progress to form an important component of international coal trading. We believe the chances are good that internet commodity trading of coal will develop to provide a modern, transparent and efficient market for steam coal, providing a replacement index to the benchmark price, as well as the risk management facilities the industry requires.

GLOBAL COAL TRADED VOLUMES





NEW DIRECTIONS IN COAL MARKETS

**STEAM COAL PRICE INDEXATION AND INTERNET TRADING IN THE
POST BENCHMARK ERA**

Clyde Henderson
Energy Economics

March 2002

4th APEC Coal TILF Worksop

Drivers of Change

- Fundamental changes to the structure of the international coal industry -
 - Deregulation of the electricity sector, the major end user of coal, has resulted in increased competition and fragmentation.
 - Consolidation of coal exporting companies.

Electricity Sector Deregulation

- Worldwide move to deregulate the electricity sector
- Government owned electricity utility monopolies split up
- Increasingly competitive environment .
- Increased focus on minimising fuel costs

Electricity Sector Deregulation

- Western Europe: single electricity market.
- Japan: IPPs and competition across traditional distribution boundaries
- Korea: KEPCO breakup .
- Taiwan: IPPs.

Supply Side Consolidation

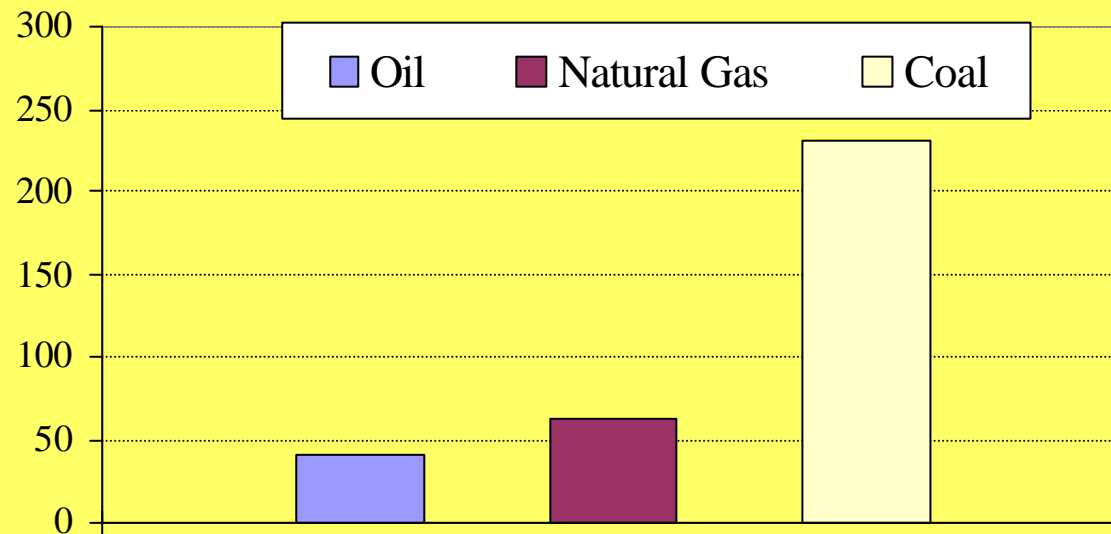
- While the electricity utility sector is fragmenting into smaller units, international coal companies are moving in the opposite direction.
- Mid 1990's industry rationalisation in the United States, Canada & South Africa.
- Belated, but rapid consolidation in Australia.

Supply Side Consolidation

- Reduced propensity for boom bust cycles.
- Impact on prices overplayed.
- Modern, well resourced international companies ready to adopt new technologies .

Coal - Not a Scarce Resource

Fossil Fuel Reserves To Production Ratios

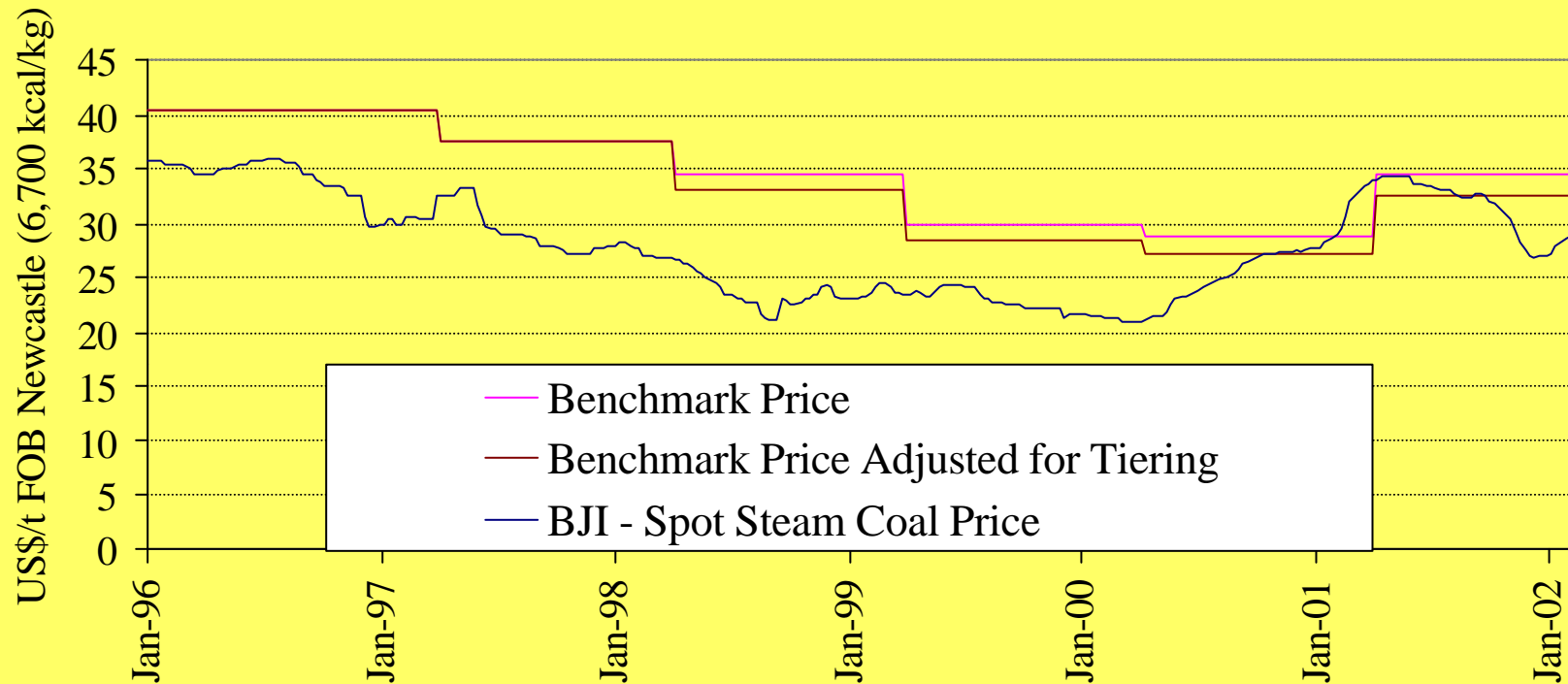


Market Changes

- The demise of the Japanese benchmark system.
- Annual price negotiations increasingly complex and inefficient.
- Increased use of tendering and an associated move to spot and short-term contracts.

Wouldn't You Buy More Spot?

STEAM COAL PRICES - BENCHMARK vs SPOT



What Now?

- A new surge in spot market activity?
- Which new price index for long-term contracts will replace the Japanese benchmark?
- The emergence of internet trading from the shadows to snare a substantial share of a growing spot market?

Price Indexation

- To our knowledge, all of the contracts that coal producers have signed to supply coal to IPPs still incorporate the Japan - Australia 'reference price' as the index for calculating future price movements. The IPP contracts do not cater for the possibility that the 'reference price' may not even exist in a couple of years time, let alone at the end of a twenty year supply contract. .

Alternative Reference Indices

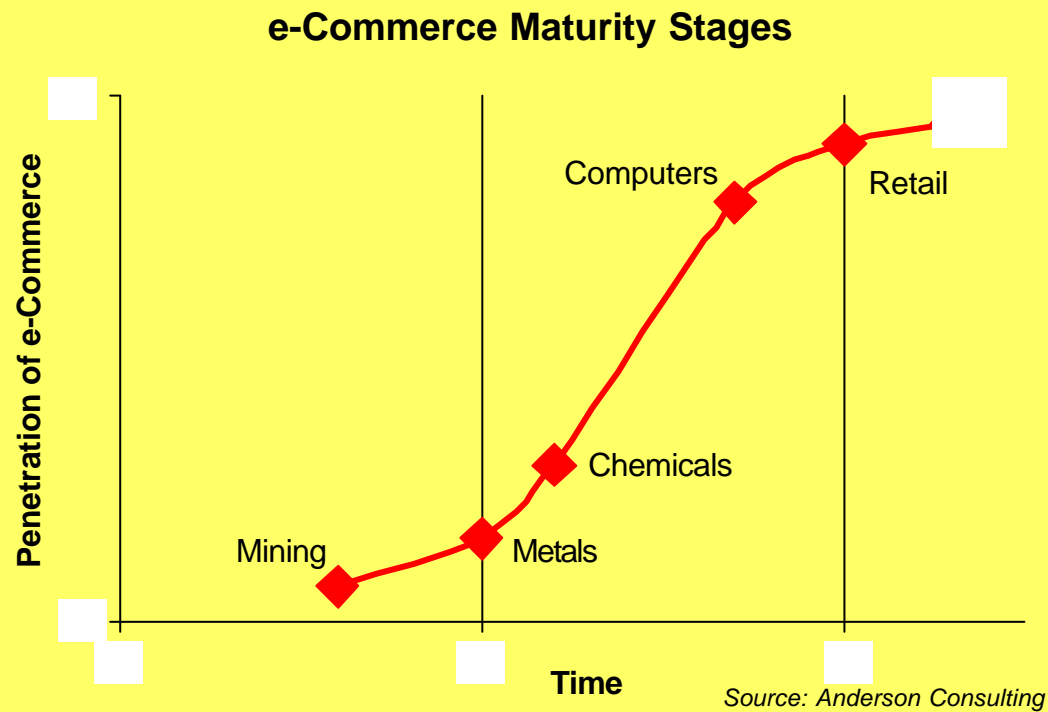
- Average New South Wales export steam coal prices.
- Proprietary indices based on market intelligence such as the Barlow Jonker Index .
- Spot steam coal prices series from internet trading markets .



Electronic Trading Systems

- Commodity trading.
- Auctions .
- Notice Boards .

E-Trading Seaborne Coal



The Variability Problem

- Coking Coal – too variable and too few suppliers to warrant e-trading.
- Steam coal
 - The value of steam coal is more firmly based on a single parameter – its energy content.
 - A large proportion of the major brands of steam coal fall within a reasonably narrow quality specification range.

The Cultural Problem

- Natural inertia.
- Investments in relationship marketing skills and contacts.
- Reluctance amongst companies with a history of success in face-to-face negotiations.

The Advantages

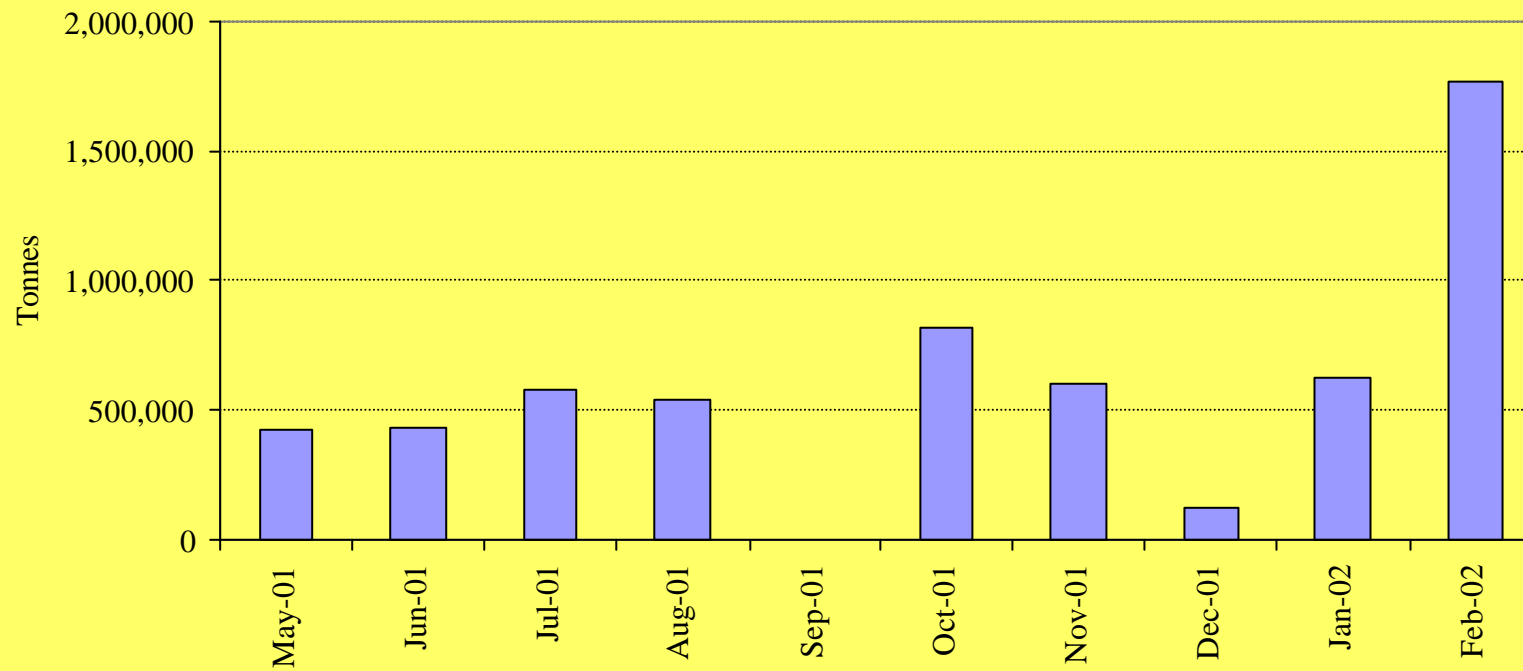
- a liquid marketplace for efficient coal trading .
- accurate pricing benchmarks and indices based on actual transactions .
- the creation of a forward pricing curve.
- the development of tools and instruments for hedging and coal price risk management.

More Advantages

- increased levels of transparency, price discovery and competitiveness .
- enhancement of coal's image as a modern and competitive fuel as it becomes more tightly integrated with other energy markets such as electricity, gas and oil .
- transaction and cost savings for all industry participants .

E-Trade

GLOBAL COAL TRADED VOLUMES



The Future

- Importers will procure increasing proportions of steam coal via spot and short-term tenders, at the expense of traditional long-term contracts with annual price negotiations.
- Internet trading will develop to provide a modern, transparent and efficient market for steam coal and a price index to replace the Japanese Benchmark system.